REMARKS

Reconsideration of the subject application is requested under the provisions of 37 CFR 1.116, since the patent to Pohlandt '681 has been newly applied in the rejection of the claims, and in fairness, it is believed that the applicant should be afforded an opportunity to point out the deficiencies of the rejection.

Base Claims 30 and 45 have been amended to highlight an important feature of the claimed invention, namely that the light sources are positioned so as to produce shadows which magnify an area of the core or core packet. Also, the processing of the recorded data includes processing a recorded image which includes the magnifying shadows. With this arrangement, it is possible to perform a more detailed examination of critical areas of the article than could be achieved by an examination of only the article itself. This novel feature is further discussed at page 5, lines 1-15 of the specification.

In the latest Official Action, Claims 30-40 42, 46, and 47 were rejected upon a proposed combination of Roy et al. '134 and Pohlandt '681.

The Roy et al. patent is directed to a transporting and inspecting system for semiconductor devices, which is seen to be non-analogous to the subject matter of the present invention. Further, the system disclosed by Roy et al. is structurally and functionally distinct from that of the claimed invention. More particularly, in the Roy et al. system, a first camera **65** (note Fig. 3) is provided to capture a two dimensional image of the semiconductor device **12**, and a second camera **60** is positioned to capture a three dimensional image. A first light source **70** serves to "completely illuminate" the surface of the device (column 6, line 62) for

the camera 65, and thus no shadows would be present. A second light source 82, which may comprise a laser, subsequently illuminates the device for the camera 60. Thus Roy et al. completely fails to teach or suggest the use of shadows to facilitate the inspection process as presently claimed, and indeed, one reading the Roy et al. disclosure would be led not to produce or utilize shadows.

Pohlandt discloses the use of cameras 5 to create optical images of foundry cores for quality control measurements, but there is no teaching or suggestion of utilizing shadows as part of the captured images. Pohlandt only teaches the broad concept of non-contacting inspection and scanning for quality control, and the specifically claimed method of the present invention is not suggested.

Contrary to the state of the art, the claimed invention does not capture only a real image of the device. Rather, the two light sources are positioned in such a way and under such an angle with respect to the article so as to purposefully generate a shadow on the article, especially at an edge tending to have defects. Through such a method it is possible to detect defects at critical edges, which are not detectable by normal imaging. These novel features are not suggested, even when Roy et al. and Pohlandt are considered collectively.

Favorable reconsideration and allowance is accordingly solicited.

In re: Beyerer et al.
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Filed: June 20, 2001
Page 6

Respectfully submitted,

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CERTIFICATION OF FACSIMILE TRANSMISSION

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Joyce D. Smith
Date: March 3, 2003

Version with Markings to Show Changes Made:

In the Specification:

Paragraph beginning at page 10, line 1 has been amended as follows:

The apparatus of the present invention accomplishes the above-described object by the provision of an [characterizing features of claim 25. Accordingly, a generic] apparatus which is characterized in that for illuminating the object, at least two light sources are provided, which illuminate the object from different directions or angles, and a [that the] camera which is used for recording the object and the shadows formed [forming] on a base as a result of the illumination. For purposes of avoiding repetitions the description of the method according to the invention is herewith incorporated by reference.

In the Claims:

Claims 30, 43, and 45 have been amended as follows:

30. (Twice Amended) A method of detecting defects on shot cores or core packets used in the foundry industry comprising the steps of

illuminating each shot core or core packet by at least two light sources from different directions and so as to produce shadows which magnify an area of the core or core packet,

recording by means of a camera each illuminated shot core or core packet and the magnifying shadows resulting from the

illumination to thereby produce recorded data which comprise a recorded image, and

processing the recorded data in a computer, and including processing the recorded image by comparing the recorded image with a record of reference data.

43. (Amended) An apparatus for detecting defects on workpieces comprising

at least two light sources for illuminating the workpiece from different directions, with the cameras being positioned so as to produce shadows which magnify an area of the workpiece,

a camera for recording the illuminated workpiece and the magnifying shadows resulting from the illumination, and

a computer for processing the data received from the camera.

45. (Amended) A method of detecting defects on shot cores or core packets used in the foundry industry comprising the steps of

illuminating each shot core or core packet by at least two light sources from different directions and so as to produce shadows which magnify an area of the core or core packet,

recording by means of a camera each illuminated shot core or core packet and the magnifying shadows resulting from the illumination to thereby produce recorded data which comprise a recorded image, and

processing the recorded data in a computer and including processing the recorded image by comparing the recorded image with a record of reference data, and

wherein the processing step further includes a brightness adjustment for adapting the gray-scale values of the image.

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OFFICIAL - FINAL RESPONSE
Appl. No. 09/868,716
Filed: June 20, 2001
In re: Beyerer et al.

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